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**In the Claims**

1. (Currently Amended) A motor controller for a motor-driven pump, the controller having at least one voltage sensor and at least one current sensor and configured to:

receive a voltage and a current signal of the pump in operation from the at least one voltage sensor and the at least one current sensor;

determine a power signal from the voltage signal and the current signal;

generate a real-time spectrum analysis of the power signal; and

determine undesirable torque conditions in the pump from the spectrum analysis;

and

automatically disable the pump if the undesirable torque condition exceeds a threshold.

2. (Original) The motor controller of claim 1 further configured to automatically provide an external indication of the undesirable torque condition in the pump.

3. (Canceled)

4. (Original) The motor controller of claim 1 further configured to apply an FFT to the power signal.

5. (Original) The motor controller of claim 1 further configured to band-pass filter the power signal.

6. (Original) The motor controller of claim 1 further configured to generate a model spectrum analysis of the pump during healthy operation and determine the undesirable torque condition in the pump by comparing the model to the real-time spectrum analysis.

7. (Original) The motor controller of claim 1 wherein the undesirable torque condition is defined by at least one of misalignment of the pump and mechanical interferences in the pump.

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8. (Currently Amended) A computer readable storage medium having stored thereon a computer program to detect and signal mechanical anomalies in a motor-driven centrifugal pump and representing a set of instructions that when executed by a processor causes the processor to:

determine an instantaneous pump motor power signal from voltage and current data collected by one or more voltage and current sensors in a motor starter of the motor-driven centrifugal pump;

signal process the instantaneous pump motor power signal;

compare the processed instantaneous pump motor power signal to a pump motor power signal modeled during healthy operation of the pump motor; and

if the processed instantaneous pump motor signal exceeds a threshold, provide an external notification signaling mechanical anomalies in the pump; and

differentiate noise from mechanical anomalies.

9. (Original) The computer readable storage medium of claim 8 wherein the set of instructions further causes the processor to perform a spectrum analysis on the instantaneous pump motor power signal.

10. (Original) The computer readable storage medium of claim 9 wherein the set of instructions further causes the processor to apply an FFT to the instantaneous pump motor power signal.

11. (Original) The computer readable storage medium of claim 9 wherein the set of instructions further causes the processor to input the instantaneous pump motor power signal to a band pass filter.

12. (Original) The computer readable storage medium of claim 8 wherein the instantaneous pump motor signal includes a three-phase power signal.

13. (Original) The computer readable storage medium of claim 8 wherein the set of instructions further causes the processor to display a spectrum analysis of the processed signal on a console.

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14. (Canceled)

15. (Currently Amended) The method of claim ~~14~~17 further comprising the step of determining an undesirable mechanical condition based on a presence of undesirable harmonics in the real-time power signal.

16. (Currently Amended) The method of claim ~~14~~17 further comprising the steps of:

conditioning the instantaneous voltage and current signals;  
digitizing the conditioned signals;  
applying FFT to the power signal;  
outputting the transformed signal to a digital-to-analog converter; and  
displaying analog signal.

17. (Currently Amended) ~~The method of claim 14 further comprising the step of A~~  
method of detecting mechanical anomalies in an operating centrifugal pump motor, the method  
comprising the steps of:

capturing an operational model of a centrifugal pump motor assembly known to  
be operating normally;

generating a baseline power signal from the modeling;

acquiring instantaneous voltage and current signals of the pump motor assembly  
from voltage and current sensors in the motor assembly;

determining a real-time power signal from the instantaneous voltage and current  
signals;

determining undesirable harmonics in the real-time power signal based on a  
comparison with the baseline power signal; and

delineating between a transient condition in the pump and the undesirable  
mechanical condition based on several cycles of undesirable harmonics in the real-time power  
signal.

18. (Currently Amended) The method of claim ~~14~~17 wherein the step of acquiring instantaneous voltage and current signals includes the step of acquiring voltage and current data from at least two phases of the pump motor.

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19. (Currently Amended) An apparatus for detecting undesirable torsional/mechanical conditions in a pump, the apparatus comprising:

at least one voltage sensor and at least one current sensor;

a processor configured to receive data from the at least one voltage sensor and the at least one current sensor, the processor having:

means for determining a power signal from the voltage and current data;

means for generating a spectrum analysis of the power signal;

means for comparing the spectrum analysis to a spectrum analysis of a modeled power signal; and

means for determining undesirable harmonics indicative of mechanical disturbances in the pump from the comparison; and

means for interrupting pump operation in response to an indication of a mechanical disturbance.

20. (Original) The apparatus of claim 19 further comprising means for displaying the spectrum analysis of the power signal on a console.